

**WASHINGTON STATE
BUILDING CODE**

CHAPTERS 51-56 and 51-57 WAC

**UNIFORM PLUMBING CODE
and
UNIFORM PLUMBING CODE STANDARDS**



Washington State Building Code Council

Effective July 1, 2002

Copies of the State Building Codes may be obtained from:

Washington Association of Building Officials
Post Office Box 7310
Olympia, Washington 98507-7310
(360) 586-6725 www.wabo/order_bo.html

Complete copies of the 2000 Uniform Plumbing Code as published by the
International Association of Plumbing and Mechanical Officials
may be obtained from:

International Association of Plumbing and Mechanical Officials
Northwest Regional Office
20001 Walnut Drive South
Walnut, California 91789-2825
(800) 85-IAPMO

**First Edition Titled
Uniform Plumbing Code
Chapters 51-56/51-57 WAC
Effective July 1, 2002
Printed March 2002**

**First Edition based on
WSR 02-01-114**

Preface

Authority: The Uniform Plumbing Code (Chapters 51-56 and 51-77 WAC) is adopted by the Washington State Building Code Council pursuant to Chapters 19.27 and 70.92 RCW. This code was first adopted by reference by the Washington State Legislature in 1974. In 1985, the Legislature delegated the responsibility of adoption and amendment of these codes to the State Building Code Council.

Supersession of Previous Codes: Chapters 51-56 and 51-57 WAC supersede Chapters 51-46 and 51-47 WAC.

Code Precedence: The State Building Code Act, Chapter 19.27 RCW, establishes the following order of precedence among the documents adopted as parts of the State Building Code:

Uniform Building Code, Standards and amendments - WAC 51-40;
Uniform Mechanical Code, Standards and amendments - WAC 51-42;
Uniform Fire Code, Standards and amendments - WAC 51-44, 51-45;
Uniform Plumbing Code, Standards and amendments - WAC 51-56, 51-57.

Where there is a conflict between codes, an earlier named code takes precedence over a later named code. In the case of conflict between the duct insulation requirements of the Uniform Mechanical Code and the duct insulation requirements of the Energy Code, the Energy Code, or where applicable, a local jurisdiction's energy code, shall govern.

Where, in any specific case, different sections of this Code specify different materials, methods of construction or other requirements, the most restrictive shall govern. Where there is conflict between a general requirement and a specific requirement, the specific requirement shall be applicable.

Organization and Numbering: These rules are written to allow compatible use with the Uniform Plumbing Code. All sections which are amended, deleted, or added are referenced.

Enforcement: The State Building Code Act requires that each local jurisdiction enforce the State Building Code within its jurisdiction. Any jurisdiction can contract with another jurisdiction or an inspection agency to provide the mandated enforcement activities.

Amendments to the State Building Code:

The State Building Code Council has adopted review procedures and approval criteria for local amendments. These procedures and criteria are found in Chapter 51-04 WAC. The Council has exempted from its review any amendments to the administrative provisions of the various codes.

Forms for proposing statewide amendments to the State Building Code are available from the State Building Code Council staff.

- A. **Amendments of Statewide Application:** On a yearly basis the State Building Code Council will consider proposals to amend the State Building Code. Unless directed by the State Legislature, federal mandates or court order, the Council will not enter formal rulemaking until 2003 as part of its consideration of adoption of the 2003 series of codes.

Proposals to amend the State Building Code shall be made on forms provided by the Building Code Council.

Code Change Proposal Submittal Deadline: March 1st of each year.

B. **Local Amendments:** Any jurisdiction may amend the State Building Code provided the amendments do not reduce the minimum performance standards of the codes. There are two areas where local amendments are limited or prohibited:

Prohibited Amendments: Chapter 11, Appendix Chapter 11, Sections 1003.3.1.1, 1003.3.1.2, 1003.3.1.5, and 1003.3.3.6 of Chapter 10 of the adopted Uniform Building Code; residential provisions of the State Energy Code (WAC 51-11), the Ventilation and Indoor Air Quality Code (WAC 51-13); and standards specifically adopted in Chapters 19.27 and 19.27A can not be amended by any local jurisdiction.

Residential Amendments: Amendments by local jurisdictions which affect the construction of single family and multi-family residential buildings must be reviewed and approved by the State Building Code Council before such amendments can be enforced. The State Building Code Act provides the following definition:

Multi-family residential building: means common wall residential buildings that consist of four or fewer units, that do not exceed two stories in height, that are less than 5,000 square feet in area, and that have a one-hour fire-resistive occupancy separation between units.

Application forms for Council review of local amendments are available from the State Building Code Council Staff.

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Printing Format: This version of the rules is published as a series of insert or replacement pages. Each page provides instructions for installing them in the uniform code book. Amendments to the uniform code which are new or revised from the previous edition of this code are indicated by a line in the margin next to the revised portions.

Effective Date: These rules were adopted by the State Building Code Council on November 9, 2001. The rules are effective throughout the state on July 1, 2002. (This version of the code is based on WAC 51-56 and 51-57 as published in WSR 02-01-114. It is subject to review by the State Legislature during the 2002 session.)

Building Permit Fees: The activities of the State Building Code Council are supported by permit fees collected by each city and county. Section 19.27.085 of the State Building Code Act requires that a fee of \$4.50 be imposed on each building permit issued by each city and county. In addition, a fee of \$2.00 per unit shall be imposed for each dwelling unit after the first unit. For the purpose of this fee, WAC 365-110-035 defines building permits as any permit to construct, enlarge, alter, repair, move, improve, remove, convert or demolish any building or structure regulated by the Building Code. Exempt from the fee are plumbing, electrical, mechanical permits, permits issued to install a mobile/manufactured home, commercial coach or factory built structure, or permits issued pursuant to the Uniform Fire Code.

Each city and county shall remit moneys collected to the state treasury quarterly. No remittance is required until a minimum of \$50.00 has accumulated.

These permit fees are the amounts current in January 2002. Such fees may be changed by the State Legislature.

Opinions: Only at the request of local enforcement officials, the State Building Code Council may issue interpretations/opinions of those provisions of the State Building Code created by the Council, or provisions of the uniform codes amended by the Council. Final interpretation authority for any specific permit resides with the local enforcement official.

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**CHAPTER 51-56 WAC
STATE BUILDING CODE ADOPTION AND AMENDMENT
OF THE 2000 EDITION OF THE UNIFORM PLUMBING CODE**

WAC 51-56-001 AUTHORITY.

These rules are adopted under the authority of Chapter 19.27 RCW.

WAC 51-56-002 PURPOSE.

The purpose of these rules is to implement the provisions of Chapter 19.27 RCW, which provides that the State Building Code Council shall maintain the State Building Code in a status which is consistent with the purpose as set forth in RCW 19.27.020. In maintaining the codes, the council shall regularly review updated versions of the codes adopted under the act, and other pertinent information, and shall amend the codes as deemed appropriate by the Council.

WAC 51-56-003 UNIFORM PLUMBING CODE.

The 2000 edition of the Uniform Plumbing Code, published by the International Association of Plumbing and Mechanical Officials, is hereby adopted by reference with the following additions, deletions and exceptions: PROVIDED that Chapters 11, 12, and 15 of this code are not adopted. PROVIDED FURTHER, that those requirements of the Uniform Plumbing Code relating to venting and combustion air of fuel fired appliances as found in Chapter 5 and those portions of the Code addressing building sewers are not adopted.

WAC 51-56-007 EXCEPTIONS.

The exceptions and amendments to the uniform codes contained in the provisions of Chapter 19.27 RCW shall apply in cases of conflict with any of the provisions of these rules.

WAC 51-56-008 IMPLEMENTATION.

The Uniform Plumbing Code adopted by Chapter 51-56 WAC shall become effective in all counties and cities of this state on July 1, 2002, unless local government residential amendments have been approved by the State Building Code Council.

101.4.1.4 Conflicts Between Codes. Delete paragraph. |

103.1.3 Certification. State rules and regulations concerning certification shall apply.

102.4 Appeals. All persons shall have the right to appeal a decision of the Administrative Authority. The jurisdiction shall have a board of appeals to hear and rule on Plumbing Code appeals. Members of the board shall be appointed by the jurisdiction. Decisions by the board shall be reported to the jurisdiction and administered by the Administrative Authority.

(Insert Facing Page 3)

Certified Backflow Assembly Tester – A person certified by the Washington State Department of Health under Chapter 246-292 WAC to inspect (for correct installation and approval status) and test (for proper operation) approved backflow assemblies.

(Insert Facing Page 10)

Flammable Vapor or Fumes – is the concentration of flammable constituents in air that exceeds 10 percent of its lower flammability limit (LFL).

Plumbing System – Includes all potable water building supply and distribution pipes, all plumbing fixtures and traps, all drainage and vent pipe(s), and all building drains including their respective joints and connection, devices, receptors, and appurtenances within the property lines of the premises and shall include potable water piping, potable

water treating or using equipment, medical gas and medical vacuum systems, and water heaters: *Provided*, that no certification shall be required for the installation of a plumbing system within the property lines and outside a building.

301.1.1 Approvals. Unless otherwise provided for in this Code, all materials, fixtures or devices used or entering into the construction of plumbing systems, or parts thereof, shall be submitted to the Administrative Authority for approval and shall conform to approved nationally recognized standards, and shall be free from defects. All pipe, fittings, traps, fixtures, material and devices used in a plumbing system shall be listed or labeled by a listing agency or shall be approved by the Administrative Authority.

301.1.3 Standards. Standards listed or referred to in this chapter and Table 14-1 cover materials that conform to the requirements of this Code, when used in accordance with the limitations imposed in this or other chapters thereof and their listing. Where a standard covers materials of various grades, weights, quality, or configurations, there may be only a portion of the listed standard which is applicable. Design and materials for special conditions or materials not provided for herein are allowed to be used only by special permission of the Administrative Authority after the Administrative Authority has been satisfied as to their adequacy in accordance with Section 301.2.

311.4 Except as hereinafter provided in Sections 908.0, 909.0, 910.0, and Appendix L, Section L 6.0, no vent pipe shall be used as a soil or waste pipe, nor shall any soil or waste pipe be used as a vent.

313.6 No water, soil, or waste pipe shall be installed or permitted outside of a building or in an exterior wall unless, where necessary, adequate provision is made to protect such pipe from freezing. All hot and cold water pipes installed outside the conditioned space shall be insulated to a minimum R-3.

313.7 All pipes penetrating floor/ceiling assemblies and fire-resistance rated walls or partitions shall be protected in accordance with the requirements of the building code.

316.1.6 Solvent Cement Plastic Pipe Joints. Plastic pipe and fittings designed to be joined by solvent cementing shall comply with this code and the manufacturer's installation instructions.

ABS pipe and fittings shall be cleaned and then joined with listed solvent cement(s).

CPVC and PVC pipe and fittings shall be cleaned and joined with listed primer(s) and solvent cement(s).

(Insert Facing Page 22)

402.0 Water-Conserving Fixtures and Fittings.

402.1 The purpose of this Section shall be to implement water conservation performance standards in accordance with RCW 19.27.170.

402.2 Application. This Section shall apply to all new construction and all remodeling involving replacement of plumbing fixtures and fittings in all residential, hotel, motel, school, industrial, commercial use, or other occupancies determined by the council to use significant quantities of water. Plumbing fixtures, fittings and appurtenances shall conform to the standards specified in this Section and shall be provided with an adequate supply of potable water to flush and keep the fixtures in a clean and sanitary condition without danger of backflow or cross-connection.

402.3 Water Efficiency Standards.**402.3.1 Standards for Vitreous China Plumbing Fixtures.**

402.3.1.1 The following standards shall be adopted as plumbing materials, performance standards, and labeling standards for water closets and urinals. Water closets and urinals shall meet either the ANSI/ASME standards or the CSA standard.

ANSI/ASME A112.19.2M-1998	Vitreous China Plumbing Fixtures
ANSI/ASME A112.19.6-1995	Hydraulic Requirements for Water Closets and Urinals
CSA B45	CSA Standards on Plumbing Fixtures

402.3.1.2 The maximum water use allowed in gallons per flush (gpf) or liters per flush (lpf) for any of the following water closets shall be the following:

Tank-type toilets	1.6 gpf/6.0 lpf
Flushometer-valve toilets	1.6 gpf/6.0 lpf
Flushometer-tank toilets	1.6 gpf/6.0 lpf
Electromechanical hydraulic toilets	1.6 gpf/6.0 lpf

- Exceptions:**
1. Water closets located in day care centers, intended for use by young children may have a maximum water use of 3.5 gallons per flush or 13.25 liters per flush.
 2. Water closets with bed pan washers may have a maximum water use of 3.5 gallons per flush or 13.25 liters per flush.
 3. Blow out bowls, as defined in ANSI/ASME A112.19.2M, Section 5.1.2.3 may have a maximum water use of 3.5 gallons per flush or 13.25 liters per flush.

402.3.1.3 The maximum water use allowed for any urinal shall be 1.0 gallons per flush or 3.78 liters per flush.

402.3.1.4 No urinal or water closet that operates on a continuous flow or continuous flush basis shall be permitted.

402.3.1.5 This section does not apply to fixtures installed before the effective date of this Section, that are removed and relocated to another room or area of the same building after the effective date of this Section.

402.3.2 Standards for Plumbing Fixture Fittings.

402.3.2.1 The following standards are adopted as plumbing material, performance requirements, and labeling standards for plumbing fixture fittings. Faucets, aerators, and shower heads shall meet either the ANSI/ASME standard or the CSA standard.

ANSI/ASME A112.18.1M-1996	Plumbing Fixture Fittings
CSA B125	Plumbing Fittings

402.3.2.2 The maximum water use allowed for any shower head is 2.5 gallons per minute or 9.5 liters per minute.

Exception: Emergency use showers shall be exempt from the maximum water usage rates.

402.3.2.3 The maximum water use allowed in gallons per minute (gpm) or liters per minute (lpm) for any of the following faucets and replacement aerators is the following:

Lavatory faucets	2.5 gpm/9.5 lpm
Kitchen faucets	2.5 gpm/9.5 lpm
Replacement aerators	2.5 gpm/9.5 lpm
Public lavatory faucets other than metering	0.5 gpm/1.9 lpm

402.4 Metering Valves. Lavatory faucets located in restrooms intended for use by the general public shall be equipped with a metering valve designed to close by spring or water pressure when left unattended (self-closing).

- Exceptions:**
1. Where designed and installed for use by persons with a disability.
 2. Where installed in day care centers, for use primarily by children under 6 years of age.

402.5 Implementation.

402.5.1 The standards for water efficiency and labeling contained within Section 402.3 shall be in effect as of July 1, 1993, as provided in RCW 19.27.170 and amended July 1, 1998.

402.5.2 No individual, public or private corporation, firm, political subdivision, government agency, or other legal entity, may, for purposes of use in the state of Washington, distribute, sell, offer for sale, import, install, or approve for installation any plumbing fixtures or fittings unless the fixtures or fittings meet the standards as provided for in this Section.

Sections 402.6 through 402.9 are not adopted.

412.2 Location of Floor Drains. Floor drains shall be installed in the following areas:

412.2.1 Toilet rooms containing two (2) or more water closets or a combination of one (1) water closet and one (1) urinal, except in a dwelling unit. The floor shall slope toward the floor drains.

412.2.2 Laundry rooms in commercial buildings and common laundry facilities in multi-family dwelling buildings.

(Insert Facing Page 28)

413.0 Minimum Number of Required Fixtures. For minimum number of plumbing fixtures required, see Building Code Chapter 29 and Table 29-A.

Sections 413.1 through 413.7 and Table 4-1 are not adopted.

501.0 General. The regulations of this chapter shall govern the construction, location, and installation of fuel burning and other water heaters heating potable water. The minimum capacity for water heaters shall be in accordance with the first hour rating listed in Table 5-1. See the Mechanical Code for combustion air and installation of all vents and their connectors. All design, construction, and workmanship shall be in conformity with accepted engineering practices and shall be of such character as to secure the results sought to be obtained by this Code. No water heater shall be hereinafter installed which does not comply in all respects with the type and model of each size thereof approved by the Administrative Authority. A list of generally accepted gas equipment standards is included in Table 14-1.

Water heaters used for space heating only are prohibited.

502.0 Definitions

502.1 Chimney – Delete definition

502.2 Chimney Connector – Delete definition

502.5 Direct Vent Appliance – Delete definition

502.7 Unusually Tight Construction – Delete definition

502.8 Vent – Delete definition

502.9 Vent Collar – Delete definition

502.10 Vent Connector – Delete definition

502.11 Venting System – Delete definition

502.12 Venting Systems—Types – Delete definition

TABLE 5-1^{1,3}

Number of Bathrooms	1 to 1.5			2 to 2.5				3 to 3.5			
Number of Bedrooms	1	2	3	2	3	4	5	3	4	5	6
First Hour Rating², Gallons	42	54	54	54	67	67	80	67	80	80	80

Notes:

¹The first hour rating is found on the "Energy Guide" label.

²Non-storage and solar water heaters shall be sized to meet the appropriate first hour rating as shown in the table.

³For replacement water heaters, see Section 101.4.1.1.1.

(Insert Facing Page 35)

505.3 Gas storage-type water heaters shall be provided with, in addition to the primary temperature controls, an over-temperature safety protection device constructed, listed, and installed in accordance with nationally recognized applicable standards for such devices and a combination temperature and pressure relief valve.

504.1 Inspection of Chimneys and Vents. Delete Paragraph.

505.0 Gas-Fired Water Heater Approval Requirements.

505.1 Gas fired water heaters shall conform to approved recognized applicable standards or to other standards acceptable to the Administrative Authority. Each such water heater shall bear the label of an approved testing agency, certifying and attesting that such equipment has been tested and inspected and meets the requirements of applicable standards.

505.2 Except when reconditioned by the manufacturer or the manufacturer's approved agent in accordance with its original approval requirements and reinstalled at its original location, each reconditioned water heater shall be tested for safety and conformity to approved standards, and shall bear the label of an approved testing agency certifying and attesting that such equipment has been tested and inspected and meets the requirements of applicable standards. Such label shall also state clearly that the water heater has been reconditioned, and shall give the name and address of the reconditioner. Every person applying for a permit to install a used or reconditioned water heater shall clearly state on the application for permit that such equipment is used or reconditioned.

506.2 All storage-type water heaters deriving heat from fuels or types of energy other than gas, shall be provided with, in addition to the primary temperature controls, an over-temperature safety protection device constructed, listed, and installed in accordance with nationally recognized applicable standards for such devices and a combination temperature and pressure relief valve.

507.0 Combustion Air. For issues relating to combustion air, see the Mechanical Code.

Delete remainder of Section 507.

(Insert Facing Page 36)

509.0 Prohibited Locations

Water heaters which depend on the combustion of fuel for heat shall not be installed in a room used or designed to be used for sleeping purposes, bathroom, clothes closets or in a closet or other confined space opening into a bath or bedroom.

- Exception:**
1. Direct vent water heaters.
 2. Water heaters installed in a closet that has a weather-stripped solid door with an approved door closing device, and designed exclusively for the water heater and where all air for combustion and ventilation is supplied from the outdoors.
 3. Water heaters of the automatic storage type installed as a replacement in a bathroom, when specifically approved, properly vented and supplied with adequate combustion air.

Where not prohibited by other regulations, water heaters may be located under a stairway or landing.

512.0 Venting of Water Heaters Delete entire Section.

(The remainder of Chapter 5 is not adopted)

513.0 Limitations Delete entire Section.

514.0 Vent Connectors. Delete entire Section.

517.0 Vent Termination. Delete entire Section

515.0 Location and Support of Venting System.
Delete entire Section.

516.0 Length Pitch and Clearance. Delete entire
Section.

(Insert Facing Page 40)

518.0 Area of Venting System. Delete entire Section

520.0 Existing Venting System. Delete entire Section.

519.0 Multiple Appliance Venting. Delete entire Section.

(Insert Facing Page 41)

521.0 Draft Hoods. Delete entire Section.

522.0 Gas Venting into Existing Masonry Chimneys.
Delete entire Section.

523.0 Chimney Connectors. Delete entire Section.

(Insert Facing Page 42)

525.0 Venting Through Ventilating Hoods and Exhaust Systems. Delete entire Section.

524.0 Mechanical Draft Systems. Delete entire Section.

(Insert Facing Page 43)

603.0 Cross-Connection Control. Cross-connection control shall be provided in accordance with the provisions of this chapter. Devices or assemblies for protection of the public water system must be models approved by the Department of Health under WAC 246-290-490. The Administrative Authority shall coordinate with the local water purveyor where applicable in all matters concerning cross-connection control within the property lines of the premises.

No person shall install any water operated equipment or mechanism, or use any water treating chemical or substance, if it is found that such equipment, mechanism, chemical or substance may cause pollution or contamination of the domestic water supply. Such equipment or mechanism may be permitted only when equipped with an approved backflow prevention device or assembly.

603.3.3 For devices and assemblies other than those regulated by the Washington Department of Health in conjunction with the local water purveyor for the protection of public water systems, the Administrative Authority shall ensure that the owner or responsible person shall have the backflow prevention assembly tested by a Washington State Department of Health certified backflow assembly tester:

1. At the time of installation, repair, or relocation; and
2. At least on an annual schedule thereafter, unless more frequent testing is required by the Administrative Authority.

603.4.6.1 Potable water supplies to systems having no pumps or connections for pumping equipment, and no chemical injection or provisions for chemical injection, shall be protected from backflow by one of the following devices:

1. Atmospheric vacuum breaker
2. Pressure vacuum breaker
3. Reduced pressure backflow preventer
4. A double check valve may be allowed when approved by the water purveyor and the Administrative Authority.
5. A spill proof pressure vacuum breaker may be allowed when approved by the water purveyor and the Administrative Authority.

603.4.13 Potable Water Supply to Carbonators shall be protected by a listed reduced pressure principle backflow preventer as approved by the Administrative Authority for the specific use.

603.4.18.1 Except as provided under Sections 603.4.18.2 and 603.4.18.3, potable water supplies to fire protection systems that are normally under pressure, including but not limited to standpipes and automatic sprinkler systems, except in one or two family residential flow-through or combination sprinkler systems piped in materials approved for potable water distribution systems, shall be protected from back-pressure and back-siphonage by one of the following testable devices:

1. Double check valve assembly
2. Double check detector assembly
3. Reduced pressure backflow preventer
4. Reduced pressure detector assembly

Potable water supplies to fire protection systems that are not normally under pressure shall be protected from backflow and shall meet the requirements of the appropriate standard(s) referenced in Table 14-1.

604.0 Materials.

604.1 Water distribution pipe, building supply water pipe and fittings shall be of brass, copper, cast iron, galvanized malleable iron, galvanized wrought iron, galvanized steel or

other approved materials. Except as provided in Section 604.13, asbestos-cement, CPVC, PE, PVC, or PEX water pipe materials manufactured to recognized standards may be used for cold water distribution systems outside a building. CPVC, PEX water pipe, tubing, and fittings, manufactured to recognized standards may be used for hot and cold water distribution systems within a building. Other products not listed in this section are acceptable for their intended use, provided that such materials or distribution systems are listed and approved in accordance with nationally recognized standards. All materials used in the water supply system, except valves and similar devices shall be of like material, except where otherwise approved by the Administrative Authority.

604.13 Plastic water piping may terminate within a building, provided the connection to the potable water distribution system shall be made as near as is practical to the point of entry and shall be accessible. Barbed insert fittings with hose clamps are prohibited within the building.

608.5 Relief valves located inside a building shall be provided with a drain, not smaller than the relief valve outlet, of galvanized steel, hard drawn copper piping and fittings, CPVC, or listed relief valve drain tube with fittings which will not reduce the internal bore of the pipe or tubing (straight lengths as opposed to coils) and shall extend from the valve to the outside of the building with the end of the pipe not more than two (2) feet (610 mm) nor less than six (6) inches (152 mm) above the ground or the flood level of the area receiving the discharge and pointing downward. Such drains may terminate at other approved locations. No part of such drain pipe shall be trapped and the terminal end of the drain pipe shall not be threaded.

Exception: Replacement water heating equipment shall only be required to provide a drain pointing downward from the relief valve to extend between two feet (610 mm) and six inches (152 mm) from the floor. No additional floor drain need be provided.

610.4 Systems within the range of Table 6-5 may be sized from that table or by the method set forth in Section 610.5.

Listed parallel water distribution systems shall be installed in accordance with their listing.



701.1.2 ABS and PVC DWV piping installations shall be installed in accordance with IS 5 and IS 9. Except for individual single family dwelling units, materials exposed within ducts or plenums shall have a flame-spread index of not more than 25 and a smoke-developed index of not more than 50, when tested in accordance with the Test for Surface-Burning Characteristics of the Building Materials (see the Building Code standards based on ASTM E-84 and ANSI/UL 723).

704.3 Delete paragraph.

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(Insert Facing Page 63)

710.3 The minimum size of any pump or any discharge pipe from a sump having a water closet connected thereto shall be not less than two (2) inches (52 mm).

Sections 710.3.1 through 710.3.3 are not adopted.

PART II — BUILDING SEWERS

Part II Building Sewers. Delete all of Part II, Sections 713 to 723, and Tables 7-7 and 7-8.

(Insert Facing Page 68)

810.4 Strainers. Every indirect waste interceptor receiving discharge containing particles that would clog the receptor drain shall have a readily removable dome strainer.

903.1.2 ABS and PVC DWV piping installations shall be installed in accordance with IS 5 and IS 9. Except for individual single family dwelling units, materials exposed within ducts or plenums shall have a flame-spread index of not more than 25 and a smoke developed index of not more than 50, when tested in accordance with the Test for Surface-Burning Characteristics of the Building Materials (See the Building Code standards based on ASTM E-84 and ANSI/UL 723).

(Insert Facing Page 77)

1302.0 Medical Gas and Vacuum Piping Systems The installation of medical gas and vacuum piping systems shall be in accordance with the requirements of this Chapter and/or the appropriate standards adopted by the administrative authority, for additional standards see Table 14-1. The Administrative Authority shall require evidence of the competency of the installers.



1309.1 The provisions herein shall apply to the design, installation, testing and verification of medical gas, medical vacuum systems, and related permanent equipment for safe use in patient care hospitals, clinics, and other health care facilities.

1309.2 The purpose of this chapter is to provide minimum requirements for the design, installation and verification of medical gas, medical vacuum systems, and related permanent equipment.

1310.3 Installer Performance Testing – Testing conducted by the installer or representative prior to system verification using oil-free, dry nitrogen as stated in Chapter 14.

1310.4 Manifold – A device for connecting outlets of one or more gas cylinders to the central piping system for that specific gas.

1310.5 Medical Air – Compressed air used in a medical facility.

1310.6 Medical Gas – Gases used in a medical facility, including oxygen, nitrous oxide, nitrogen, carbon dioxide, helium, medical air, and mixtures of these gases. Standards of purity apply.

1310.7 Medical Gas System – A system consisting of a central supply system (manifold, bulk, or compressors), including control equipment and piping extending to station outlets in the facility where medical gases may be required.

1310.8 Medical Vacuum System – A system consisting of central vacuum-producing equipment with vacuum switches and operating controls, shutoff valves, alarm warning systems, gauges, and a network of piping extending to and terminating with station inlets at locations where patient suction may be required. Includes surgical vacuum systems, waste anesthesia gas disposal (as scavenging systems), and bedside suction systems.

1310.9 Purge, Flow – The removal of oxygen from a system by oil-free dry nitrogen during brazing.

1310.10 Purge, System – The removal of nitrogen from a system with the medical gas required for that system.

1310.11 SCFM – Standard cubic feet per minute, the unit measure for a volume of gas at standard conditions (68 degrees F [20 degrees C] and 1 atmosphere of pressure).

1310.12 Special Hazard Area – An area, such as a kitchen or electrical switch gear room.

1310.13 Station Inlet – An inlet in a vacuum piping system at which the user makes connections and disconnections.

1310.14 Station Outlet – An outlet point in a medical gas piping system at which the user makes connections and disconnections.

1310.15 System Verification – Testing conducted by a qualified party other than the installer or material vendor after the installer performance testing and prior to the medical gas system being put into service.

1310.16 Use Point – A room or area within a room, where medical gases are dispensed to a patient for medical purposes.

1310.17 User Outlet – See station outlet.

1310.18 Valve, Isolation – A valve which isolates one piece of equipment from another.

1310.19 Valve, Riser – A valve at the base of a vertical riser, which isolates that riser.

1310.20 Valve, Service – A valve serving horizontal piping extending from a riser to a station outlet or inlet.

1310.21 Valve, Source – A single valve at the source which controls a number of units that make up the total source.

1310.22 Valve, Zone – A valve which controls the gas or vacuum to a particular area.

→ **1311.3** The Administrative Authority shall require evidence of the competency of the installers.

13011.4 Delete paragraph.

1313.0 System Installation and Installer Performance Testing

1313.1 Medical gas and medical vacuum systems shall be designed and installed in accordance with the requirements of this chapter and the installation requirements of this code, specifically Chapter 14 of this code.

1313.2 A report of completion of the installer performance testing which includes the specific items in Chapter 14 shall be furnished to the Administrative Authority prior to system verification.

1313.3 Delete paragraph.

1314.0 System Verification

1314.1 Prior to any medical gas system being placed in service, each and every system shall be verified as described in Chapter 14. This verification shall be accomplished by an independent third party verification agency which is approved by the Administrative Authority.

1314.2 A report which includes at least the specific items in Chapter 14 shall be furnished to the Administrative Authority prior to final acceptance of the system.

Sections 1315 through 1331 are not adopted.

CHAPTER 14

REFERENCED STANDARDS

Table 14-1

Standards for Materials, Equipment, Joints and Connections

**Where more than one standard has been listed for the same material or method,
the relevant portions of all such standards shall apply.**

(Remainder of page remains as printed)

NFPA 99-96 (Ch. 2 & 4)	Medical Gas System	Piping
NFPA 99-96 (Ch. 2 & 4)	Medical – Surgical Vacuum Systems	Piping

UL 80-96	Steel Inside Tanks for Oil-Burner Fuel	Miscellaneous
UL 103-95	Factory-Built Chimneys for Residential Type and Building Heating Appliances	Miscellaneous
UL 125-97	Valves for Anhydrous Ammonia and LP-Gas (Other than Safety Relief)	Valves
UL 132-97	Safety Relief Valves for Anhydrous Ammonia and LP-Gas	Valves
UL 430-94	Waste Disposers	Appliances

(Insert Facing Page 146)

Standard Number	Standard Title	Application	Indicate if not Approved
UL 144-99	LP Gas Regulators	Valves	
UL 174-96	Household Electric Storage Tank Water Heaters	Appliances	
UL 343-97	Pumps for Oil-Burning Appliances	Pumps	
UL 352-97	Constant-Level Oil Valves	Valves	
UL 378-93	Draft Equipment	Miscellaneous	
UL 399-93	Drinking-Water Coolers	Appliances	
UL 441-96	Gas Vents	Miscellaneous	
UL 443-95	Steel Auxiliary Tanks for Oil-Burner Fuel	Miscellaneous	
UL 499-97	Electrical Heating Appliances	Appliances	
UL 563-95	Ice Makers	Appliances	
UL 569-95	Pigtails and Flexible Hose Connectors for LP-Gas	Fuel Gas	
UL 723-96	Test for Surface Burning Characteristics of Building Materials	Miscellaneous	
UL 726-95	Oil-Fired Boiler Assemblies	Appliances	
UL 732-95	Oil-Fired Storage Tank Water Heaters	Appliances	
UL 749-97	Household Dishwashers	Appliances	
UL 778-96	Motor-Operated Water Pumps	Pumps	
UL 834-95	Heating, Water Supply, and Power Boilers - Electric	Appliances	
UL 921-96	Commercial Electric Dishwashers	Appliances	
UL 1453-5	Electric Booster and Commercial Storage Tank Water Heaters	Appliances	
WAC 246-290-490	Washington State Department of Health Cross Connection Control Requirements	Backflow Protection	

Appendix M Storm Drainage

M 1.0 General.

M 1.1 Where Required. All roofs, paved areas, yards, courts, and courtyards shall be drained into a separate storm sewer system, or into a combined sewer system where a separate storm sewer system is not available, or to some other place of disposal satisfactory to the Administrative Authority. In the case of one- and two-family dwellings, storm water may be discharged on flat areas such as streets or lawns so long as the storm water shall flow away from the building and away from adjoining property, and shall not create a nuisance.

M 1.2 Storm Water Drainage to Sanitary Sewer

Prohibited. Storm water shall not be drained into sewers intended for sanitary drainage only.

M 1.3 Material Uses. Rainwater piping placed within the interior of a building or run within a vent or shaft shall be of cast iron, galvanized steel, wrought iron, brass, copper, lead, Schedule 40 ABS DWV, Schedule 40 PVC DWV, or other approved materials, and changes in direction shall conform to the requirements of Section 706.0.

M 1.4 Expansion Joints Required. Expansion joints or sleeves shall be provided where warranted by temperature variations or physical conditions.

M 1.5 Subsoil Drains.

M 1.5.1 Subsoil drains shall be provided around the perimeter of buildings having basements, cellars, or crawl spaces or floors below grade. Such subsoil drains may be positioned inside or outside of the footing, shall be of perforated, or open-jointed approved drain tile or pipe not less than three (3) inches (76 mm) in diameter, and shall be laid in gravel, slag, crushed rock, approved three-quarter (3/4) inch (19.1 mm) crushed recycled glass aggregate, or other approved porous material with a minimum of four (4) inches (102 mm) surrounding the pipe on all sides. Filter media shall be provided for exterior subsoil piping.

M 1.5.2 Subsoil drains shall be piped to a storm drain, to an approved water course, to the front street curb or gutter, or to an alley; or the discharge from the subsoil drains shall be conveyed to the alley by a concrete gutter. Where a continuously flowing spring or groundwater is encountered, subsoil drains shall be piped to a storm drain or an approved water course.

M 1.5.3 Where it is not possible to convey the drainage by gravity, subsoil drains shall discharge to an accessible sump pit provided with an approved automatic electric pump. A sump pit shall be at least fifteen (15) inches

(381 mm) in diameter, eighteen (18) inches (457 mm) in depth, and provided with a fitted cover. The sump pump shall have an adequate capacity to discharge all water coming into the sump as it accumulates to the required discharge point, and the capacity of the pump shall not be less than fifteen (15) gpm (1.0 L/s). The discharge piping from the sump pump shall be a minimum of one and one-half (1-1/2) inches (38 mm) in diameter and have a union to make the pump accessible for servicing.

M 1.5.4 For separate dwellings not serving continuously flowing springs or groundwater, the sump discharge pipe may discharge onto a concrete splash block with a minimum length of twenty-four (24) inches (610 mm). This pipe shall be within four (4) inches (102 mm) of the splash block and positioned to direct the flow parallel to the recessed line of the splash block.

M 1.5.5 Subsoil drains subject to backflow when discharging into a storm drain shall be provided with a backwater valve in the drain line so located as to be accessible for inspection and maintenance.

M 1.5.6 Nothing in Section M 1.5 shall prevent drains that serve either subsoil drains or areaways of a detached building from discharging to a properly graded open area, provided that:

- (1) They do not serve continuously flowing springs or groundwater;
- (2) The point of discharge is at least ten (10) feet (3048 mm) from any property line; and
- (3) It is impracticable to discharge such drains to a storm drain, to an approved water course, to the front street curb or gutter, or to an alley.

M 1.6 Building Subdrains. Building subdrains located below the public sewer level shall discharge into a sump or receiving tank, the contents of which shall be automatically lifted and discharged into the drainage system as required for building sumps.

M 1.7 Areaway Drains. All open subsurface space adjacent to a building, serving as an entrance to the basement or cellar of a building, shall be provided with a drain or drains. Such areaway drains shall be two (2) inches (51 mm) minimum diameter for areaways not exceeding one hundred (100) square feet (9.3 m²) in area, and shall be discharged in the manner provided for subsoil drains not serving continuously flowing springs or ground water (see Section M 1.5.2). Areaways in excess of one hundred (100) square feet (9.3 m²) shall not drain into subsoil. Areaway drains for areaways exceeding one hundred (100) square feet (9.3 m²) shall be sized according to Table M-2.

M 1.8 Window Areaway Drains. Window areaways not exceeding ten (10) square feet (0.9 m^2) in area may discharge to the subsoil drains through a two (2) inch (51 mm) pipe. However, window areaways exceeding ten (10) square feet (0.9 m^2) in area shall be handled in the manner provided for entrance areaways (see Section M 1.7).

M 1.9 Filling Stations and Motor Vehicle Washing Establishments. Public filling stations and motor vehicle washing establishments shall have the paved area sloped toward sumps or gratings within the property lines. Curbs not less than six (6) inches (152 mm) high shall be placed where required to direct water to gratings or sumps.

M 1.10 Paved Areas. Where the occupant creates surface water drainage, the sumps, gratings or floor drains shall be piped to a storm drain or an approved water course.

M 1.11 Roof Drainage.

M 1.11.1 Primary Roof Drainage. Roof areas of a building shall be drained by roof drains or gutters. The location and sizing of drains and gutters shall be coordinated with the structural design and pitch of the roof. Unless otherwise required by the Administrative Authority, roof drains, gutters, vertical conductors or leaders, and horizontal storm drains for primary drainage shall be sized based on a storm of sixty (60) minutes duration and 100-year return period (see Appendix D).

M 1.11.2 Secondary Roof Drainage.

M 1.11.2.1 Where parapet walls or other construction extend above the roof and create areas where storm water would become trapped if the primary roof drainage system failed to provide sufficient drainage, an independent secondary roof drainage system consisting of scuppers, standpipes, or roof drains shall be provided. Secondary roof drainage systems shall be sized in accordance with Section M 1.11.1 of this Code. Overflow drains shall be the same size as the roof drains with the inlet flow line two (2) inches (51 mm) above the low point of the roof and shall be installed independent from the roof drains.

M 1.11.2.2 Where secondary roof drainage is provided by means of roof drains or standpipes, the secondary system shall be separate from the primary system and shall discharge independently at grade or other approved point of discharge.

M 1.11.2.3 Where secondary roof drainage is provided, the overflow level(s) into the secondary system shall be determined by the structural design of the roof, including roof deflection, at a level not less than two (2) inches (51 mm) above the level of the primary drain. An allowance shall be made to account for the required overflow head of water above the secondary inlets. The elevation of the secondary inlet plus the required overflow head shall not exceed the maximum allowable water level on the roof.

M 1.11.2.4 Scuppers shall be sized as rectangular weirs, using hydraulic principles to determine the required length and resulting overflow head (see Appendix D). Secondary roof drains and standpipes shall be sized according to Table M-1. Where standpipes are used, the head allowance required under Section M 1.11.2.3 shall be not less than one and one-half (1-1/2) inches (38 mm).

M 1.11.3 Equivalent Systems. When approved by the Administrative Authority, the requirements of Sections M 1.11.1 and M 1.11.2 shall not preclude the installation of an engineered roof drainage system that has sufficient capacity to prevent water from ponding on the roof in excess of that allowed in the roof structural design with a rainfall rate of at least twice that for a 100-year, 60-minute storm and with a blockage in any single point in the storm drainage system.

M 1.12 Cleanouts.

M 1.12.1 Cleanouts for building storm drains shall comply with the requirements of this Section. Rain leaders and conductors connected to a building storm sewer shall have a cleanout installed at the base of the outside leader or outside conductor before it connects to the horizontal drain. Cleanouts shall be placed inside the building near the connection between the building drain and the building sewer or installed outside the building at the lower end of the building drain and extended to grade.

M 1.12.2 Each cleanout shall be installed so that it opens to allow cleaning in the direction of flow of the soil or waste or at right angles thereto, and except in the case of wye branch and end-of-line cleanouts, shall be installed vertically above the flow line of the pipe.

M 1.12.3 Cleanouts installed under concrete or asphalt paving shall be made accessible by yard boxes, or extending flush with paving with approved materials and be adequately protected.

M 1.12.4 Approved manholes may be installed in lieu of cleanouts when first approved by the Administrative Authority. The maximum distance between manholes shall not exceed three hundred (300) feet (91.4 m).

The inlet and outlet connections shall be made by the use of a flexible compression joint no closer than twelve (12) inches (305 mm) to, and not farther than three (3) feet (914 mm) from the manhole. No flexible compression joints shall be embedded in the manhole base.

M 1.13 All rainwater sumps serving "public use" occupancy buildings shall be provided with dual pumps arranged to function alternately in case of overload or mechanical failure.

M 2.0 Materials.**M 2.1 Conductors.**

M 2.1.1 Conductors installed aboveground in buildings shall be constructed of materials specified in Table 14-1.

M 2.1.2 The inside of conductors installed above ground level shall be of seamless copper water tube, Type K, L or M; Schedule 40 copper pipe or Schedule 40 copper alloy pipe; Type DWV copper drainage tube; service weight cast iron soil pipe or hubless cast iron soil pipe; standard weight galvanized steel pipe; or Schedule 40 ABS or Schedule 40 PVC plastic pipe.

M 2.2 Leaders.

M 2.2.1 Leaders shall be constructed of materials specified in Table 14-1.

M 2.2.2 Leaders shall be of seamless copper water tube, Type K, L or M; Schedule 40 copper pipe; Schedule 40 copper alloy pipe; type DWV copper drainage tube; service weight cast iron soil pipe or hubless cast iron soil pipe; galvanized steel sheet metal or copper sheet metal; standard weight galvanized steel pipe; Class DL or XL lead pipe; or Schedule 40 ABS or Schedule 40 PVC plastic pipe.

M 2.3 Underground Building Storm Drains. All underground building storm drains shall be constructed of materials specified in Table 14-1.

M 2.4 Building Storm Sewers. Building storm sewers shall be constructed of materials specified in Table 14-1.

M 2.5 Subsoil Drains.

M 2.5.1 Subsoil drains shall be constructed of materials specified in Table 14-1.

M 2.5.2 Subsoil drains shall be open-jointed or of perforated pipe, vitrified clay, plastic, cast iron, or porous concrete.

M 3.0 Traps on Storm Drains and Leaders.

M 3.1 Where Required. Leaders and storm drains, when connected to a combined sewer, shall be trapped. Floor and area drains connected to a storm drain shall be trapped.

Exception: Traps shall not be required where roof drains, rain leaders and other inlets are at locations allowed under Section 906.0, Vent Terminals.

M 3.2 Where Not Required. No trap shall be required for a leader(s) or conductor(s) which is connected to a sewer carrying storm water exclusively.

M 3.3 Trap Size. Traps, when installed for individual conductors, shall be the same size as the horizontal drain to which they are connected.

M 3.4 Method of Installation of Combined Sewer.

Individual storm-water traps shall be installed on the storm-water drain branch serving each storm-water inlet, or a single trap shall be installed in the main storm drain just before its connection with the combined building sewer. Such traps shall be provided with an accessible cleanout on the outlet side of the trap.

M 4.0 Leaders, Conductors, and Connections.

M 4.1 Improper Use. Leaders or conductors shall not be used as soil, waste, or vent pipes, nor shall soil, waste, or vent pipes be used as leaders or conductors.

M 4.2 Protection of Leaders. Leaders installed along alleyways, driveways, or other locations where they may be exposed to damage shall be protected by metal guards, recessed into the wall, or constructed from ferrous pipe.

M 4.3 Combining Storm with Sanitary Drainage. The sanitary and storm drainage system of a building shall be entirely separate, except where a combined sewer is used, in which case the building storm drain shall be connected in the same horizontal plane through single wye fittings to the combined building sewer at least ten (10) feet (3048 mm) downstream from any soil stack.

M 5.0 Roof Drains.**M 5.1 Material.**

M 5.1.1 Roof drains shall be constructed of materials specified in Table 14-1.

M 5.1.2 Roof drains shall be of cast iron, copper or copper alloy, lead or plastic.

M 5.2 Dome or Strainer for General Use. All roof drains and overflow drains, except those draining to hanging gutters, shall be equipped with strainers extending not less than four (4) inches (102 mm) above the surface of the roof immediately adjacent to the drain. Strainers shall have a minimum inlet area above the roof level of not less than one and one-half (1-1/2) times the area of the conductor or leader to which the drain is connected.

M 5.3 Strainers for Flat Decks. Roof drain strainers for use on sun decks, parking decks, and similar areas which are normally serviced and maintained may be of the flat surface-type. Such roof drain strainers shall be level with the deck and shall have an available inlet area of no less than two (2) times the area of the conductor or leader to which the drain is connected.

M 5.4 Roof Drain Flashings. Connection between the roof and roof drains which pass through the roof and into the interior of the building shall be made watertight by the use of proper flashing material.

M 5.4.1 Where lead flashing material is used, it shall be a minimum of four (4) pounds per square foot (19.5 kg/m²).

M 5.4.2 Where copper flashing material is used, it shall be a minimum of twelve (12) ounces per square foot (3.7 kg/m²).

M 6.0 Size of Leaders, Conductors, and Storm Drains

M 6.1 Vertical Conductors and Leaders. Vertical conductors and leaders shall be sized on the basis of the maximum projected roof area and Table M-1.

M 6.2 Size of Horizontal Storm Drains and Sewers. The size of building storm drains or building storm sewers or any of their horizontal branches shall be based upon the maximum projected roof or paved area to be handled and Table M-2.

M 6.3 Size of Roof Gutters. The size of semicircular gutters shall be based on the maximum projected roof area and Table M-3.

M 6.4 Side Walls Draining onto a Roof. Where vertical walls project above a roof so as to permit storm water to drain to the roof area below the adjacent roof area may be computed from Table M-1 as follows:

1. For one (1) wall – add fifty (50) percent of the wall area to the roof area figures.
2. For two (2) adjacent walls – add thirty-five (35) percent of the total wall areas.
3. Two (2) walls opposite of same height – add no additional area.
4. Two (2) walls opposite of differing heights – add fifty (50) percent of wall area above top of lower wall.
5. Walls on three (3) sides – add fifty (50) percent of area of the inner wall below the top of the lowest wall, plus allowance for area of wall above top of lowest wall, per (2) and (4) above.
6. Walls on four (4) sides – no allowance for wall areas below top of lowest wall – add for areas above the top of the lowest wall per (1), (2), (4) and (5) above.

M 7.0 Values for Continuous Flow.

Where there is a continuous or semi-continuous discharge into the building storm drain or building storm sewer, as from a pump, ejector, air-conditioning plant, or similar device, one (1) gpm (3.8 L/min.) of such discharge shall be computed as being equivalent to twenty-four (24) square feet (2.2 m²) of roof area, based upon a rate of rainfall of four (4) inches (102 mm) per hour.

M 8.0 Testing.

M 8.1 Testing Required. New building storm drainage systems and parts of existing systems that have been altered, extended or repaired shall be tested as described in Section M 8.2.1 to disclose leaks and defects.

M 8.2 Methods of Testing Storm Drainage Systems.

Except for outside leaders and perforated or open jointed drain tile, the piping of storm drain systems shall be tested upon completion of the rough piping installation by water or air, and proved tight. The Administrative Authority may require the removal of any cleanout plugs to ascertain if the pressure has reached all parts of the system. Either of the following test methods shall be used:

M 8.2.1 Water Test. After piping has been installed, the water test shall be applied to the drainage system, either in its entirety or in sections. If applied to the entire system, all openings in the piping shall be tightly closed except for the highest opening, and the system shall be filled with water to the point of overflow. If the system is tested in sections, each opening shall be tightly plugged except for the highest opening of the section under test, and each section shall be filled with water, but no section shall be tested with less than a ten (10) foot (3048 mm) head of water. In testing successive sections, at least the upper ten (10) foot (3048 mm) of the next preceding section shall be tested so that no joint of pipe in the building (except the uppermost ten (10) foot (3048 mm) of a roof drainage system, which shall be filled with water to the flood level of the uppermost roof drain) shall have been submitted to a test of less than a ten (10) foot (3048 mm) head of water. The water shall be kept in the system or in the portion under test for at least fifteen (15) minutes before inspection starts; the system shall then be tight at all points.

M 8.2.2 Air Test. The air test shall be made by attaching an air compressor testing apparatus to any suitable opening after closing all other inlets and outlets to the system, forcing air into the system until there is a uniform gage pressure of five (5) psi (34.5 kPa) or sufficient to balance a column of mercury ten (10) inches (254 mm) in height. This pressure shall be held without introduction of additional air for a period of at least fifteen (15) minutes.

M 8.2.3 Exceptions. When circumstances exist that make air and water tests, described in Sections M 8.2.1 and M 8.2.2 above, impractical, and for minor maintenance, repairs and installations, the Administrative Authority may perform the inspection as considered advisable by said authority to assure that the work has been in accordance with provisions of this Code.

TABLE M-1
Sizing Roof Drains, Leaders, and Vertical Rainwater Piping

Size of Drain, Leader or Pipe, Inches	Flow, gpm	Maximum Allowable Horizontal Projected Roof Areas Square feet at Various Rainfall Rates					
		1"/Hr	2"/Hr	3"/Hr	4"/Hr	5"/Hr	6"/Hr
2	23	2176	1088	725	544	435	363
3	67	6440	3220	2147	1610	1288	1073
4	144	13,840	6920	4613	3460	2768	2307
5	261	25,120	12,560	8373	6280	5024	4187
6	424	40,800	20,400	13,600	10,200	8160	6800
8	913	88,000	44,000	29,333	22,000	17,600	14,667

TABLE M-1 (Metric)
Sizing Roof Drains, Leaders, and Vertical Rainwater Piping

Size of Drain, Leader or Pipe, mm	Flow, L/s	Maximum Allowable Horizontal Projected Roof Areas Square meters at Various Rainfall Rates					
		25mm/Hr	50mm/Hr	75mm/Hr	100mm/Hr	125mm/Hr	150mm/Hr
50	1.5	202	101	67	51	40	34
75	4.2	600	300	200	150	120	100
100	9.1	1286	643	429	321	257	214
125	16.5	2334	1117	778	583	467	389
150	26.8	3790	1895	1263	948	758	632
200	57.6	8175	4088	2725	2044	1635	1363

Notes:

1. The sizing data for vertical conductors, leaders, and drains is based on the pipes flowing 7/24 full.
2. For rainfall rates other than those listed, determine the allowable roof area by dividing the area given in the 1 inch/hour (25 mm/hr) column by the desired rainfall rate.
3. Vertical piping may be round, square, or rectangular. Square pipe shall be sized to enclose its equivalent round pipe. Rectangular pipe shall have at least the same cross-sectional area as its equivalent round pipe, except that the ratio of its side dimensions shall not exceed 3 to 1.

TABLE M-2
Sizing of Horizontal Rainwater Piping

Size of Pipe, Inches	Flow at 1/8"/ft slope, gpm	Maximum Allowable Horizontal Projected Roof Areas Square Feet at Various Rainfall Rates					
		1"/Hr	2"/Hr	3"/Hr	4"/Hr	5"/Hr	6"/Hr
3	34	3288	1644	1096	822	657	548
4	78	7520	3760	2506	1880	1504	1253
5	139	13,360	6680	4453	3340	2672	2227
6	222	21,400	10,700	7133	5350	4280	3566
8	478	46,000	23,000	15,330	11,500	9200	7670
10	860	82,800	41,400	27,600	20,700	16,580	13,800
12	1384	133,200	66,600	44,400	33,300	26,650	22,200
15	2473	238,000	119,000	79,333	59,500	47,600	39,650

Size of Pipe, Inches	Flow at 1/4"/ft slope, gpm	Maximum Allowable Horizontal Projected Roof Areas Square Feet at Various Rainfall Rates					
		1"/Hr	2"/Hr	3"/Hr	4"/Hr	5"/Hr	6"/Hr
3	48	4640	2320	1546	1160	928	773
4	110	10,600	5300	3533	2650	2120	1766
5	196	18,880	9440	6293	4720	3776	3146
6	314	30,200	15,100	10,066	7550	6040	5033
8	677	65,200	32,600	21,733	16,300	13,040	10,866
10	1214	116,800	58,400	38,950	29,200	23,350	19,450
12	1953	188,000	94,000	62,600	47,000	37,600	31,350
15	3491	336,000	168,000	112,000	84,000	67,250	56,000

Size of Pipe, Inches	Flow at 1/2"/ft slope, gpm	Maximum Allowable Horizontal Projected Roof Areas Square Feet at Various Rainfall Rates					
		1"/Hr	2"/Hr	3"/Hr	4"/Hr	5"/Hr	6"/Hr
3	68	6576	3288	2192	1644	1310	1096
4	156	15,040	7520	5010	3760	3010	2500
5	278	26,720	13,360	8900	6680	5320	4450
6	445	42,800	21,400	14,267	10,700	8580	7140
8	956	92,000	46,000	30,650	23,000	18,400	15,320
10	1721	165,600	82,800	55,200	41,400	33,150	27,600
12	2768	266,400	133,200	88,800	66,600	53,200	44,400
15	4946	476,000	238,000	158,700	119,000	95,200	79,300

Notes:

1. The sizing data for horizontal piping is based on the pipes flowing full.
2. For rainfall rates other than those listed, determine the allowable roof area by dividing the area given in the 1 inch/hr (25mm/hr) column by the desired rainfall rate.

TABLE M-2 (Metric)
Sizing of Horizontal Rainwater Piping

Size of Pipe, mm	Flow at 10mm/m slope, L/s	Maximum Allowable Horizontal Projected Roof Areas Square Meters at Various Rainfall Rates					
		25mm/Hr	50mm/Hr	75mm/Hr	100mm/Hr	125mm/Hr	150mm/Hr
75	2.1	305	153	102	76	61	51
100	4.9	700	350	233	175	140	116
125	8.8	1241	621	414	310	248	207
150	14.0	1988	994	663	497	398	331
200	30.2	4273	2137	1424	1068	855	713
250	54.3	7692	3846	2564	1923	1540	1282
300	87.3	12,375	6187	4125	3094	2476	2062
375	156.0	22,110	11,055	7370	5528	4422	3683

Size of Pipe, mm	Flow at 20mm/m slope, L/s	Maximum Allowable Horizontal Projected Roof Areas Square Meters at Various Rainfall Rates					
		25mm/Hr	50mm/Hr	75mm/Hr	100mm/Hr	125mm/Hr	150mm/Hr
75	3.0	431	216	144	108	86	72
100	6.9	985	492	328	246	197	164
125	12.4	1754	877	585	438	351	292
150	19.8	2806	1403	935	701	561	468
200	42.7	6057	3029	2019	1514	1211	1009
250	76.6	10,851	5425	3618	2713	2169	1807
300	123.2	17,465	8733	5816	4366	3493	2912
375	220.2	31,214	15,607	10,405	7804	6248	5202

Size of Pipe, mm	Flow at 40mm/m slope, L/s	Maximum Allowable Horizontal Projected Roof Areas Square Meters at Various Rainfall Rates					
		25mm/Hr	50mm/Hr	75mm/Hr	100mm/Hr	125mm/Hr	150mm/Hr
75	4.3	611	305	204	153	122	102
100	9.8	1400	700	465	350	280	232
125	17.5	2482	1241	827	621	494	413
150	28.1	3976	1988	1325	994	797	663
200	60.3	8547	4273	2847	2137	1709	1423
250	108.6	15,390	7695	5128	3846	3080	2564
300	174.6	24,749	12,374	8250	6187	4942	4125
375	312.0	44,220	22,110	14,753	11,055	8853	7367

Notes:

1. The sizing data for horizontal piping is based on the pipes flowing full.
2. For rainfall rates other than those listed, determine the allowable roof area by dividing the area given in the 1 inch/hr (25mm/hr) column by the desired rainfall rate.

TABLE M-3
Size of Gutters

Diameter of Gutter in Inches	Maximum Rainfall in Inches per Hour				
1/16" per ft slope	2	3	4	5	6
3	340	226	170	136	113
4	720	480	360	288	240
5	1250	834	625	500	416
6	1920	1280	960	768	640
7	2760	1840	1380	1100	918
8	3980	2655	1990	1590	1325
10	7200	4800	3600	2880	2400

Diameter of Gutter in Inches	Maximum Rainfall in Inches per Hour				
1/8" per ft slope	2	3	4	5	6
3	480	320	240	192	160
4	1020	681	510	408	340
5	1760	1172	880	704	587
6	2720	1815	1360	1085	905
7	3900	2600	1950	1560	1300
8	5600	3740	2800	2240	1870
10	10200	6800	5100	4080	3400

Diameter of Gutter in Inches	Maximum Rainfall in Inches per Hour				
1/4" per ft slope	2	3	4	5	6
3	680	454	340	272	226
4	1440	960	720	576	480
5	2500	1668	1250	1000	834
6	3840	2560	1920	1536	1280
7	5520	3680	2760	2205	1840
8	7960	5310	3980	3180	2655
10	14,400	9600	7200	5750	4800

Diameter of Gutter in Inches	Maximum Rainfall in Inches per Hour				
1/2" per ft slope	2	3	4	5	6
3	960	640	480	384	320
4	2040	1360	1020	816	680
5	3540	2360	1770	1415	1180
6	5540	3695	2770	2220	1850
7	7800	5200	3900	3120	2600
8	11,200	7460	5600	4480	3730
10	20,000	13,330	10,000	8000	6660

**TABLE M-3 (Metric)
Size of Gutters**

Diameter of Gutter in mm	Maximum Rainfall in Millimeters per Hour				
5.2mm/m slope	50.8	76.2	101.6	127.0	152.4
76.2	31.6	21.0	15.8	12.6	10.5
101.6	66.9	44.6	33.4	26.8	22.3
127.0	116.1	77.5	58.1	46.5	38.7
152.4	178.4	119.1	89.2	71.4	59.5
177.8	256.4	170.9	128.2	102.2	85.3
203.2	369.7	246.7	184.9	147.7	123.1
254.0	668.9	445.9	334.4	267.6	223.0

Diameter of Gutter in mm	Maximum Rainfall in Millimeters per Hour				
10.4mm/m slope	50.8	76.2	101.6	127.0	152.4
76.2	44.6	29.7	22.3	17.8	14.9
101.6	94.8	63.3	47.4	37.9	31.6
127.0	163.5	108.9	81.8	65.4	54.5
152.4	252.7	168.6	126.3	100.8	84.1
177.8	362.3	241.5	181.2	144.9	120.8
203.2	520.2	347.5	260.1	208.1	173.7
254.0	947.6	631.7	473.8	379.0	315.9

Diameter of Gutter in mm	Maximum Rainfall in Millimeters per Hour				
20.9mm/m slope	50.8	76.2	101.6	127.0	152.4
76.2	63.2	42.2	31.6	25.3	21.0
101.6	133.8	89.2	66.9	53.5	44.6
127.0	232.3	155.0	116.1	92.9	77.5
152.4	356.7	237.8	178.4	142.7	118.9
177.8	512.8	341.9	256.4	204.9	170.9
203.2	739.5	493.3	369.7	295.4	246.7
254.0	1338.0	891.8	668.9	534.2	445.9

Diameter of Gutter in mm	Maximum Rainfall in Millimeters per Hour				
41.7mm/m slope	50.8	76.2	101.6	127.0	152.4
76.2	89.2	59.5	44.6	35.7	29.7
101.6	189.5	126.3	94.8	75.8	63.2
127.0	328.9	219.2	164.4	131.5	109.6
152.4	514.7	343.3	257.3	206.2	171.9
177.8	724.6	483.1	362.3	289.9	241.4
203.2	1040.5	693.0	520.2	416.2	346.5
254.0	1858.0	1238.4	929.0	743.2	618.7

WAC 51-57

State Building Code Amendment and Adoption of Appendix A and Appendix I of the 2000 Edition of the Uniform Plumbing Code

WAC 51-57-001 AUTHORITY.

These rules are adopted under the authority of Chapter 19.27 RCW.

WAC 51-57-002 PURPOSE.

The purpose of these rules is to implement the provisions of Chapter 19.27 RCW, which provides that the State Building Code Council shall maintain the State Building Code in a status which is consistent with the purpose as set forth in RCW 19.27.020. In maintaining the codes, the Council shall regularly review updated versions of the codes adopted under the act, and other pertinent information, and shall amend the codes as deemed appropriate by the Council.

WAC 51-57-003 UNIFORM PLUMBING CODE STANDARDS.

The 2000 Edition of the Uniform Plumbing Code Standards (Appendixes A and I), published by the International Association of Plumbing and Mechanical Officials is hereby adopted by reference.

WAC 51-57-007 EXCEPTIONS.

The exceptions and amendments to the Uniform Codes contained in the provisions of Chapter 19.27 RCW shall apply in cases of conflict with any of the provisions of these rules.

WAC 51-57-008 IMPLEMENTATION.

The Uniform Plumbing Code Standards adopted by Chapter 19.27 RCW shall become effective in all counties and cities of this state on July 1, 2002, unless local government residential amendments have been approved by the State Building Code Council.

604.1 Location. Polyethylene piping may terminate within a building or structure. The connection to the potable water distribution system shall be accessible, except that it may be buried underground outside of the building or structure in an accessible location. Barbed insert fittings with hose clamps are prohibited within a building.

(Insert Facing Page 264)

604.1 Location. PVC piping may terminate within a building or structure. The connection to the potable water distribution system shall be accessible, except that it may be buried underground outside of the building or structure in an accessible location.